

## IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Patent Application of

Mitsufumi WADA et al.

Application No.:

Filed: March 28, 2006

For: BIOCATALYST FOR PRODUCTION OF  
D-LACTIC ACID (as amended)

Group Art Unit:

Examiner:

Confirmation No.:

## FIRST INFORMATION DISCLOSURE STATEMENT

Commissioner for Patents  
P.O. Box 1450  
Alexandria, VA 22313-1450

Sir:

In accordance with the duty of disclosure as set forth in 37 C.F.R. § 1.56, the accompanying information is being submitted in accordance with 37 C.F.R. §§ 1.97 and 1.98. Pursuant to 37 C.F.R. § 1.98, a copy of each of the documents cited is enclosed.

To assist the Examiner, the documents are listed on the attached form PTO-1449. It is respectfully requested that an Examiner initialed copy of this form be returned to the undersigned.

Respectfully submitted,

BUCHANAN INGERSOLL PC

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Substitute for form 1449A/PTO &amp; 1449B/PTO

# **FIRST INFORMATION DISCLOSURE STATEMENT BY APPLICANT**

(use as many sheets as necessary)

Sheet

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of

2

Complete if Known

Application Number

10/573813

Filing Date

March 28, 2006

First Named Inventor

Mitsufumi WADA et al.

Examiner Name

Attorney Docket Number

1034232-000019

## **U.S. PATENT DOCUMENTS**

Examiner Initials	Document Number	Kind Code (if known)	Name of Patentee or Applicant of Cited Document	Issue/Publication Date (MM-DD-YYYY)

## **FOREIGN PATENT DOCUMENTS**

Examiner Initials	Document Number	Kind Code (if known)	Country	Date of Publication (MM-DD-YYYY)	STATUS						
					Translation	Partial Translation	Eng. Lang. Summary	Search Report	IPER	Abstract	Cited in Spec
	2003-159091	A	JP	06-03-2003	X*			X		X*	
	11-056361	A	JP	03-02-1999	X*					X*	X

## **NON-PATENT LITERATURE DOCUMENTS**

Examiner Initials	Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc.), date, page(s), volume-issue number(s), publisher, city and/or country where published.
	ZHOU et al., "Production of Optically Pure D-Lactic Acid in Mineral Salts Medium by Metabolically Engineered <i>Escherichia coli</i> W3110," <i>Applied and Environmental Microbiology</i> , Jan. 2003, pp 399-407, Vol. 69, No. 1, American Society of Microbiology*
	DYM et al., "The crystal structure of D-lactate dehydrogenase, a peripheral membrane respiratory enzyme," <i>Proc. Natl. Acad. Sci.</i> , Aug 15, 2000, pp 9413-9418, Vol. 97, No. 17, USA*
	BLATTNER et al., " <i>Escherichia coli</i> K-12 MG1655 section 192 of 400 of the complete genome," Database GenBank Accession No. AE000302, Dec 1, 2000*
	SHAW et al., "Vinylglycolate Resistance in <i>Escherichia coli</i> ," <i>Journal of Bacteriology</i> , Mar 1975, pp 1047-1055, Vol. 121, No. 3, American Society for Microbiology*
	MOCHIZUKI et al., "Test Production of D-lactic Acid by Use of <i>Bacillus Coli</i> ," Presentation at the Japan Agricultural and Horticultural Chemistry Society 2004 Convention, March 2004, No. 2A11p22, p 43, Japan Society for Bioscience, Biotechnology and Agrochemistry*
	CHANG et al., "Homofermentative Production of D- or L-Lactate in Metabolically Engineered <i>Escherichia coli</i> RR1," <i>Applied and Environmental Microbiology</i> , Apr 1999, pp 1384-1389, Vol. 65, No. 4, American Society for Microbiology*
	CONTAG et al., "Cloning of a Lactate Dehydrogenase Gene from <i>Clostridium acetobutylicum</i> B643 and Expression in <i>Escherichia coli</i> ," <i>Applied and Environmental Microbiology</i> , Dec 1990, pp 3760-3765, Vol. 56, No. 12, American Society for Microbiology*
	YANG et al., "Redistribution of Metabolic Fluxes in <i>Escherichia coli</i> with Fermentative Lactate Dehydrogenase Overexpression and Deletion," <i>Metabolic Engineering</i> 1, 1999, pp 141-152, Academic Press*
	BUNCH et al., "The <i>IdhA</i> gene encoding the fermentative lactate dehydrogenase of <i>Escherichia coli</i> ," <i>Microbiology</i> , 1997, pp 187-195, Vol. 143, Great Britain*
	KOCHHAR et al., "Cloning and overexpression of <i>Lactobacillus helveticus</i> D-lactate dehydrogenase gene in <i>Escherichia coli</i> ," <i>Eur. J. Biochem.</i> , 1992, pp 799-805, Vol. 308, FEBS*

Examiner Signature		Date Considered	
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\*EXAMINER: Initial if reference considered, whether or not citation is in conformance with M.P.E.P. § 609. Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to Applicant.

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		Application Number	10/573813		
		Filing Date	March 28, 2006		
		First Named Inventor	Mitsufumi WADA et al.		
		Examiner Name			
Sheet	2	of	2	Attorney Docket Number	1034232-000019

## NON-PATENT LITERATURE DOCUMENTS

Examiner Initials	Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc.), date, page(s), volume-issue number(s), publisher, city and/or country where published.
	KOCHHAR et al., "Cloning and overexpression of the <i>Lactobacillus bulgaricus</i> NAD <sup>+</sup> -dependent D-lactate dehydrogenase gene in <i>Escherichia coli</i> : purification and characterization of the recombinant enzyme," <i>Biochemical and Biophysical Research Communications</i> , June 15, 1992, pp 705-712, Vol. 185, No. 2, Academic Press, Inc.*
	SOLEM et al., "Modulation of Gene Expression Made Easy," <i>Applied and Environmental Microbiology</i> , May 2002, pp 2397-2403, Vol. 68, No. 5, American Society for Microbiology*
	BARNES et al., "Mechanisms of Active Transport in Isolated Membrane Vesicles," <i>The Journal of Biological Chemistry</i> , Sep 10, 1971, pp 5518-5522, Vol. 246, No. 17, USA*
	MAT-JAN et al., "Mutants of <i>Escherichia coli</i> Deficient in the Fermentative Lactate Dehydrogenase," <i>Journal of Bacteriology</i> , Jan 1989, pp 342-348, Vol. 171, No. 1, American Society for Microbiology*
	COURTRIGHT et al., "Malate Dehydrogenase Mutants in <i>Escherichia coli</i> K-12," <i>Journal of Bacteriology</i> , June 1970, pp 722-728, Vol. 102, No. 3, American Society for Microbiology*
	DREYFUS et al., "Consequences of Aspartase Deficiency in <i>Yersinia pestis</i> ," <i>Journal of Bacteriology</i> , Nov. 1978, pp 757-764, Vol. 136, No. 2, American Society for Microbiology*
	HANSEN et al., "Properties of Mutants of <i>Escherichia coli</i> Lacking Malic Dehydrogenase and Their Revertants," <i>The Journal of Biological Chemistry</i> , May 10, 1979, pp 3570-3575, Vol. 254, No. 9*

\*Copy attached.

Examiner Signature		Date Considered	
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